[0020] In the cell-containing container of the present embodiment, an electrode array may be placed on a culture surface of the container. That is, the cell-containing container of the present embodiment may be a MEA plate. The number of electrodes in MEA and the like can be appropriately selected according to an application.

[0021] An organic material and an inorganic material described below are exemplary examples of a material of the culture surface of the culture container. One kind of these may be used alone and two or more kinds thereof may be used in combination.

[0022] The organic material is not particularly limited and can be appropriately selected according to the purpose. Polyethylene terephthalate (PET), polystyrene (PS), polycarbonate (PC), triacetyl cellulose (TAC), polyimide (PI), Nylon (Ny), low density polyethylene (LDPE), medium density polyethylene (MDPE), vinyl chloride, vinylidene chloride, polyphenylene sulfide, polyether sulfone, polyethylene naphthalate, polypropylene, an acrylic material such as urethane acrylate, cellulose, a silicone-based material such as polydimethylsiloxane (PDMS), polyvinyl alcohol (PVA), metal alginate salts such as calcium alginate, polyacrylamide, methylcellulose, and a gel-like material such as agarose arc exemplary examples.

[0023] The inorganic material is not particularly limited and may be appropriately selected according to the purpose, and glass and ceramics are exemplary examples thereof.

[0024] The culture surface of the culture container may be coated with a coating agent. The coating agent usually used for cell culture can be appropriately used, and collagen, Matrigel (registered trademark, Corning), Geltrex (Thermo Fisher Scientific), PLO (Sigma-Aldrich), PDLO (Sigma-Aldrich), fibronectin, fibrinogen, gelatin, polyethyleneimine (PEI), laminin, and the like are exemplary examples thereof.

[0025] The nerve cell contained in the cell-containing container of the present embodiment may be a cell collected from a living body or a cell that has been established and cultured. In addition, from the viewpoint that it is easy to obtain a desired cell population containing a large amount of nerve cells, the cells may be differentiated from stem cells. That is, the nerve cells may be derived from stem cells.

[0026] Embryonic stem cells (ES cells), induced pluripotent stem cells, mesenchymal stem cells, cord blood-derived stem cells, nerve stem cells, and the like are exemplary examples of stem cells. Nuclear-transplanted embryonic stem cells (ntES cells), induced pluripotent stem cells (iPS cells), and the like are exemplary examples of induced pluripotent stem cells. Bone marrow mesenchymal stem cells, adipose tissue-derived mesenchymal stem cells, and the like are exemplary examples of mesenchymal stem cells. Among them, the stem cells are preferably iPS cells.

[0027] The iPS cells may be derived from a healthy person or a patient having various nervous system diseases. In addition, the cells that have been subjected to various gene edits may be used. For example, cells that have been engineered to have a gene that is a cause or risk factor of various nervous system diseases by gene edits may be used.

[0028] In a case where the iPS cells are derived from a patient with various nervous system diseases, the iPS cells can be used to construct a disease model of the nervous systems. A nervous system disease is not particularly limited, and neurodegenerative diseases, autism, epilepsy, attention-deficit hyperactivity disorder (ADHD), schizophrenia, bipolar disorder, and the like are exemplary examples thereof. Alzheimer's disease, Parkinson's disease, amyotrophic lateral sclerosis, and the like are exemplary examples of the neurodegenerative diseases.

[0029] Animal species from which the nerve cells are derived are not particularly limited, and humans, monkeys, dogs, cows, horses, sheep, pigs, rabbits, mice, rats, guinea pigs, and hamsters are exemplary examples thereof. Among these, humans are preferable.

[0030] Also, one kind of the nerve cells may be used alone or a mixture of two or more kinds of nerve cells may be used. The nerve cells can be roughly classified into, for example, peripheral nerves and central nerves. Sensory nerve cells, motor nerve cells, and autonomic nerve cells are exemplary examples of peripheral nerves. Intervening nerve cells and projection neurons are exemplary examples of the central nerves. Cortical neurons, hippocampal neurons, amygdala neurons, and the like are exemplary examples of the projection neurons. In addition, the central nerve cells can be roughly classified into excitatory neurons and inhibitory neurons. Glutamic acid-operated neurons mainly responsible for excitatory transmission in the central nervous system, GABA (γ-aminobutyric acid)-operated neurons mainly responsible for inhibitory transmission, and the like are exemplary examples thereof.

[0031] Cholinergic neurons, dopaminergic neurons, noradrenalinergic neurons, serotonergic neurons, histaminergic neurons, and the like are exemplary examples of other neurons that release neuromodulators.

[0032] The cell-containing container of the present embodiment may contain astrocytes, microglia, and the like together with nerve cells. An adhesion area between the nerve cells and the culture surface of the culture container is 0.5 mm^2 or more, preferably 0.949 mm^2 or more, more preferably 3 mm^2 or more, and still more preferably 3.14 mm^2 or more, per 80,000 nerve cells. Also, an upper limit of the adhesion area between the nerve cells and the culture surface of the culture container is preferably about 28.2 mm^2.

[0033] In addition, it is preferable that the nerve cells are mature depending on the purpose. For example, it is preferable that the expression of one the marker gene of Tubulin beta3, MAP2, NeuN, 160 kDa Neurofilament, 200 kDa Neurofilament, NSE, PSD93, and PSD95 is positive.

[0034] As the medium contained in the cell-containing container of the present embodiment, a medium suitable for the cells to be used can be appropriately selected and used, as long as the concentration of glucose in the medium is 1 g/L or higher.

[0035] A medium in which a necessary component is added to a basal medium is a specific exemplary examples of the medium. Dulbecco's Modified Eagle's Medium (DMEM), Ham F12 medium (Ham's Nutrient Mixture F12), D-MEM/F12 medium, McCoy's 5A medium, Eagle's MDM medium (Eagle's Minimum Essential Medium, EMEM), αMEM medium (alpha Modified Eagle's Medium Essential Medium, αMEM), MEM medium (Minimum Essential Medium), RPMI1640 (Roswell Park Memorial Institute-1640) medium, Iscove's Modified Dulbecco's Medium (IMDM), MCDB131 medium, William Medium E, IPL41 medium, Fischer's medium, M199 medium, High Performance Medium 199, StemPro34 (manufactured by Thermo Fisher Scientific), X-VIVO 10 (manufactured by Chembrex), X-VIVO 15 (manufactured by Chembrex), HPGM (manufactured by Chembrex), StemSpan H3000 (manufac-